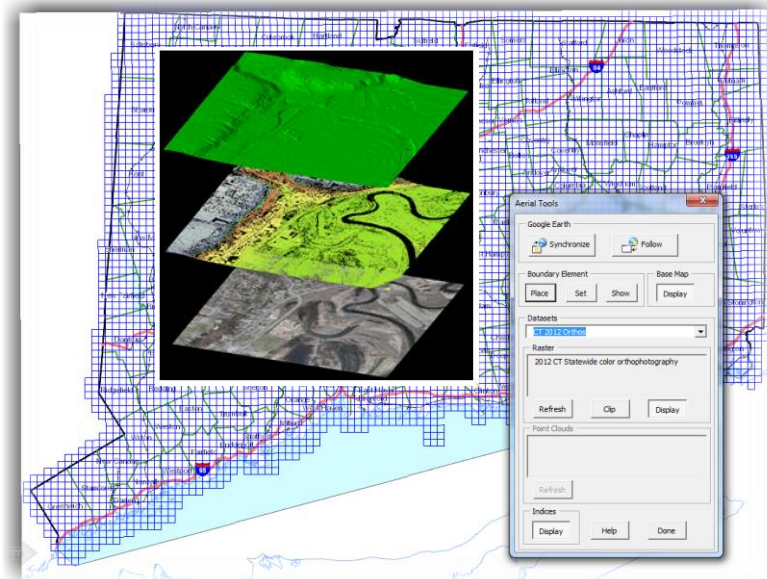




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AEC Applications – Division of Facilities & Transit



Guide to the Earth Exploration Toolset with MicroStation V8i

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Section 1 Introduction

The CT DOT MicroStation Earth Exploration toolset was created to improve the process of attaching aerial photography and creating surfaces from LiDAR Data. The CT DOT MicroStation Earth Exploration toolset can be found on the CTDOT Utilities menu bar. The menu includes the Aerial Tools application as well as specific tools to spatially locate data and create, view and edit terrain data.

All of the tools except for “Load Aerial Tools Application” can be accessed from other areas of MicroStation; however they have been put in this menu to provide easy access to the tools required throughout the workflows in this document.

The Aerial Tools Application is a MicroStation Visual Basic Application (MVBA) specifically programmed for use with CT DOT data. It is used to locate Rasters (aerial photos) and Point Clouds (LiDAR data) and extract the needed files into MicroStation. This program also provides access to a basemap of Connecticut, so having to manually reference the DGN files such as ground files and TRU maps are no longer required. If you have existing DGN ground files you may elect to reference them in to help further define your location but it is not a requirement.

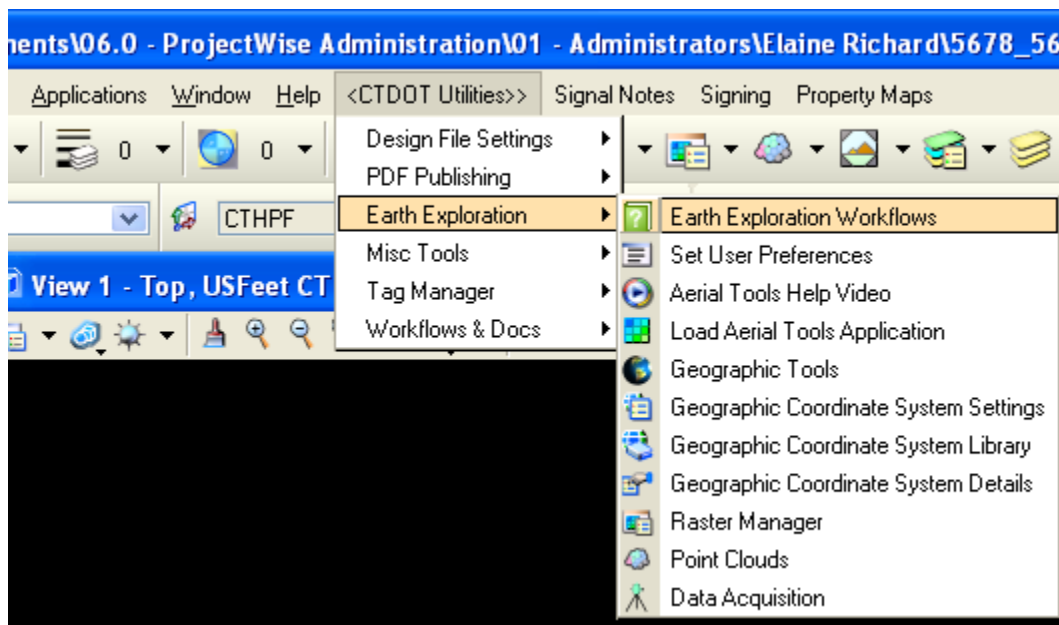


Figure 1-1 Earth Exploration Toolset

1.1 Getting Started

To use these workflows you will need to be working in ProjectWise with geo-coordinated MicroStation files. By opening a MicroStation file through ProjectWise you will have access to the latest MicroStation workspace; this workspace will connect you to the custom CT DOT Earth Exploration menu. Users will use the Earth Exploration Toolset to harvest their needed aerial photos and LiDAR data. Detailed instructions are outline in this document for the procedure to export these files to the network or your local computer.

The following minimum software versions are required to use the Earth Exploration Toolset.

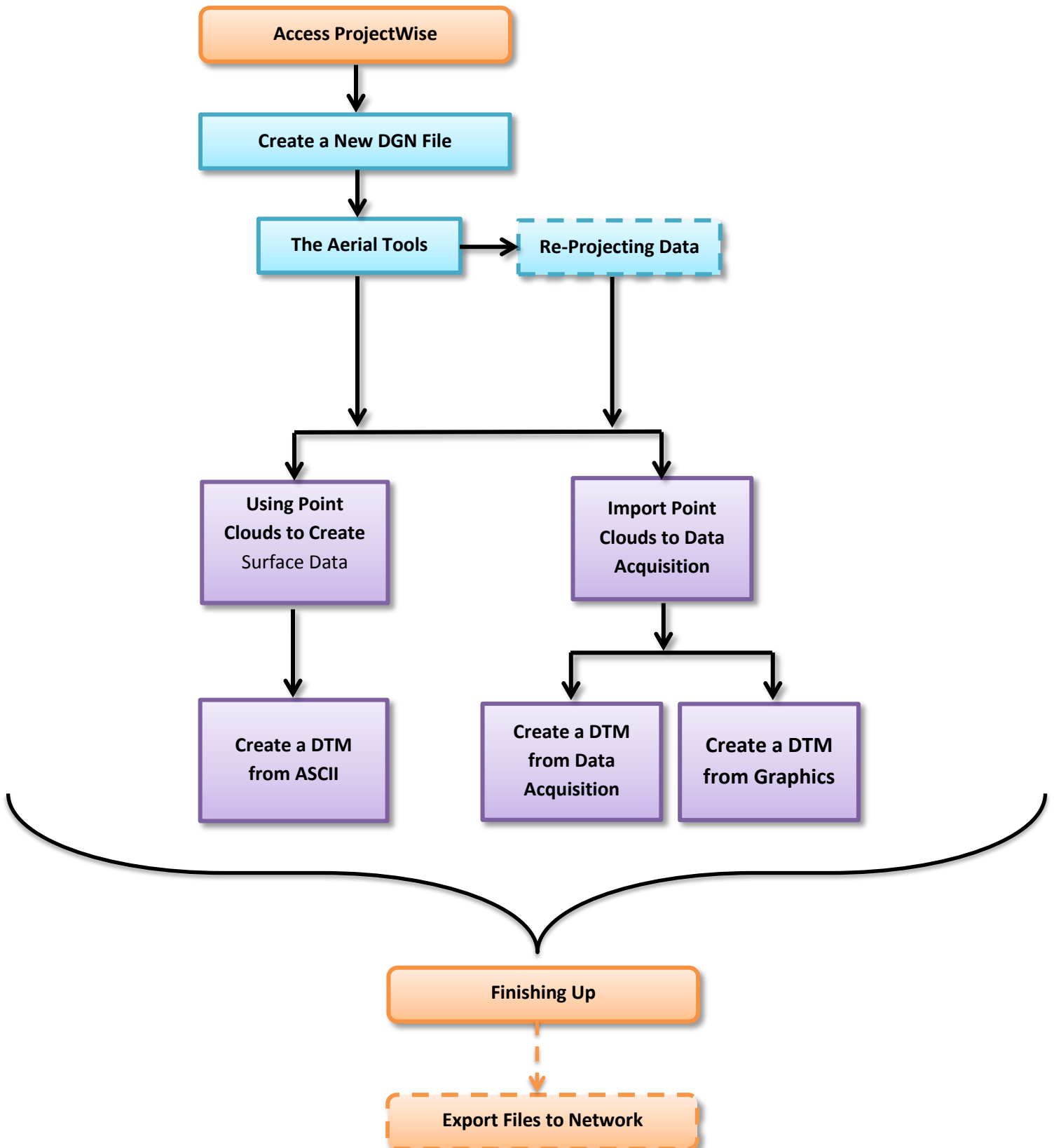
- ProjectWise Explorer (SS4) 08.11.11.111
- MicroStation (SS3) 08.11.09.397
- InRoads (SS2) 08.11.07.615

If you are a Connecticut Department of Transportation state employee and need to be upgraded send an email to Chris Sparks Chris.Sparks@ct.gov in the IT department and give him your computer name along with the version list above.

Contact Elaine Richard x3278 or John Rinaldi x3323 in AEC Applications to get started working in ProjectWise.

Prerequisites for using this workflow include basic MicroStation and InRoads knowledge including understanding InRoads surface commands.

1.2 Flow Chart



Section 2 Setup

2.1 Access ProjectWise

1. On your desk top double click on the ProjectWise Explorer Icon or go to **Start > Programs > Bentley > ProjectWise V8i (SELECT Series 4) > ProjectWise Explorer**.
2. Double click on **CTDOT** and log into ProjectWise.

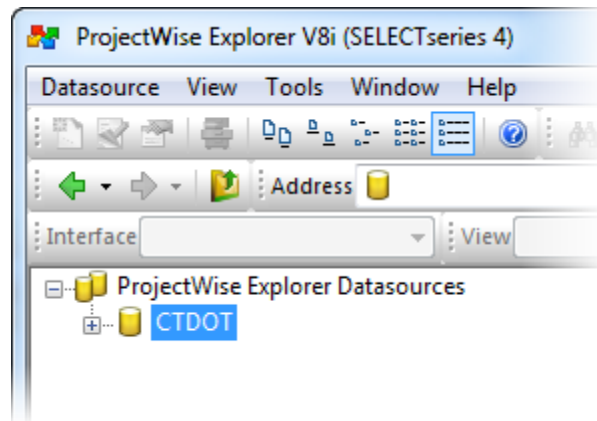


Figure 2-1 ProjectWise Explorer

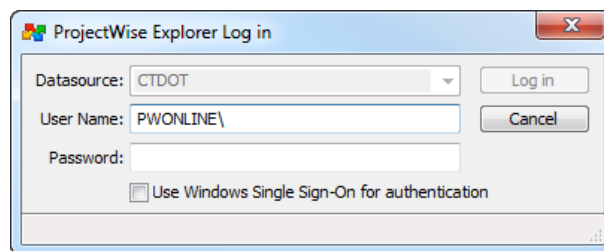


Figure 2-2 ProjectWise Explorer Log in Dialog Box

3. In ProjectWise locate your project, right click top folder and select **Properties**.

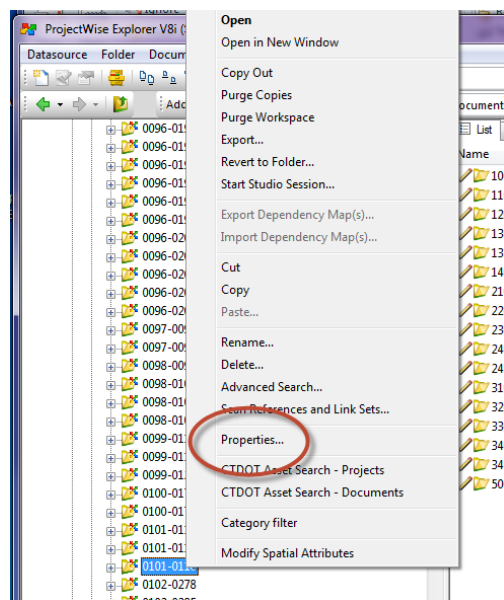


Figure 2-3 ProjectWise Explorer Selecting Properties

4. Select the **Workspace** Tab. If you only see a Personal Workspace block or your blocks do not match the bottom image below please contact AEC Applications. Users that are piloting OpenRoads will need to contact AEC Applications for the required Blocks.

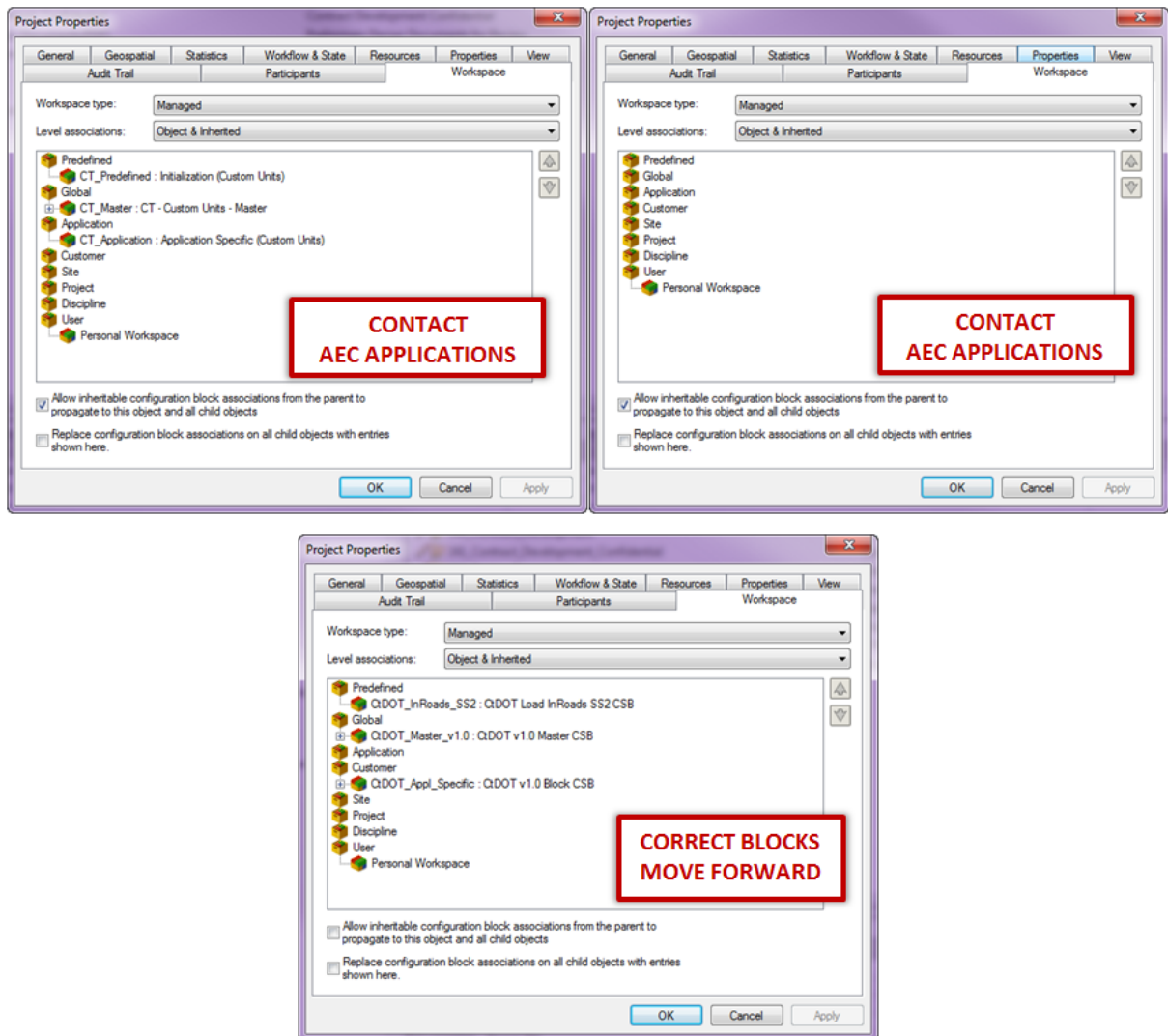


Figure 2-4 ProjectWise Managed Workspace Blocks

2.2 Create a New DGN File

1. In your project container browse to your discipline folder.

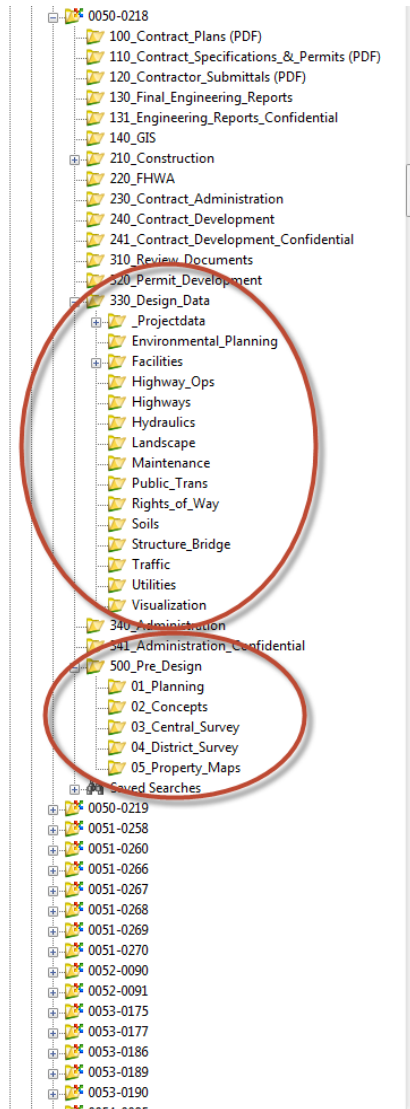


Figure 2-5 ProjectWise Discipline Folders

2. Set your interface to CTDOT_Doc_Code

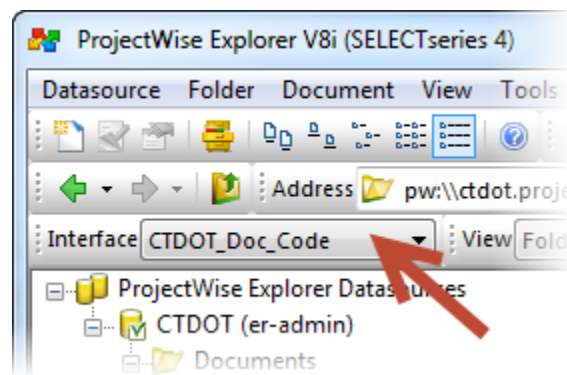


Figure 2-6 ProjectWise Explorer – Selecting the Interface

3. After selecting the correct Interface select **Document > New > Document** on the ProjectWise menu bar. Select Advanced Wizard and click **OK**.
4. The Advanced Document Creation Wizard will open, select **Next >**.
5. On the Select Target Folder dialog box verify the storage location that the new file will be placed in and change as needed. Select **Next>**.
6. On the Select a Template dialog box you will browse to select a seed file. Select **Use ProjectWise document as a template** and click the **Select...** button.

Browse to the seed file in the following ProjectWise location:

05.0 - Workspace Resources\2_Workspace_V8i\Standards\seed\Design_Seed3d_USFeet83.dgn

7. Click the **Open** button and the Select Template Document dialog box will close. On the Select a Template Dialog box select **Next >**.
8. On the define Document Attributes dialog box select the attributes. Below is an example for a Highway user. Select the three attributes and give your file a label and description. Select **Next>**.

Advanced Document Creation Wizard

Define Document Attributes
You should define environment specific document attributes.

Discipline
HW

Main Category
CAD

Sub Category
DRAFT

Sub-Category Description

Project Number(s)
NON-PROJECT

Label (User Defined)
EarthExploration

Document Date (mm/dd/yyyy)

Description
File used to attach Point Clouds and Rasters

CTDOT Asset Tags

Bridge No(s)

Building No(s)

Signal Intersections No(s)

State Route No(s)

Sign Structures No(s)

Town Road ID(s)

Town No(s)

Leave this section blank

< Back Next > Cancel

Figure 2-7 ProjectWise Advanced Document Creation Wizard

9. Click **Next** until you get to the last dialog box and select Finish. In ProjectWise immediately select **F5** on your key board to update the screen. Your file name will match the attributes given to your file in the advanced wizard.

10. To open the file, right click on it in ProjectWise Explorer and select **Open With...**

Most users will select MicroStation V8i (SelectSeries 3) with the Description **MicroStation V8i (SelectSeries 3)**. Users that are piloting OpenRoads please contact AEC Applications for the needed selection.

Select the **OK** button and the file will open. The first time in will take a couple minutes as the workspace files get cached to your computer. The next time in the file will open much faster.

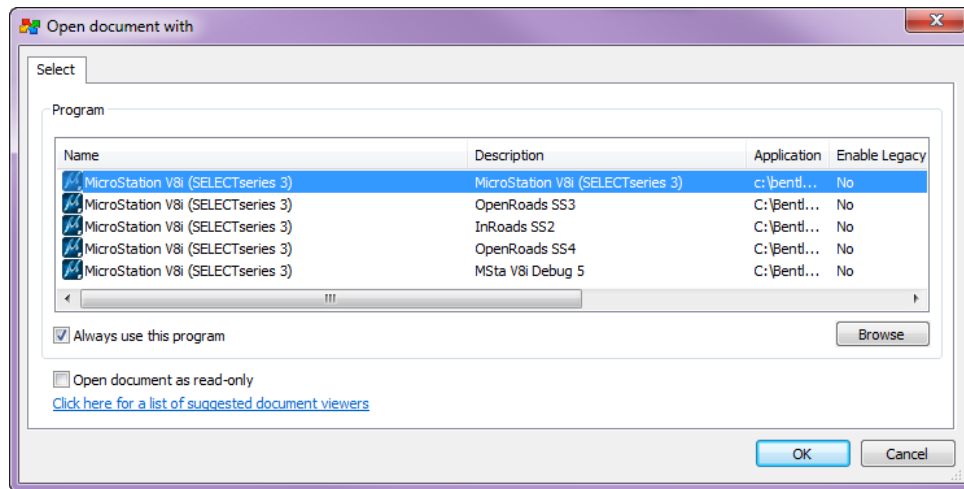


Figure 2-8 ProjectWise Open With Dialog Box

2.3 Design File Settings

1. Your MicroStation file will now be opened. On the MicroStation main menu **select CTDOT Utilities > Earth Exploration > Set User Preferences**. Select the **Georeference Tab**. Set as shown below and select the **OK** button.

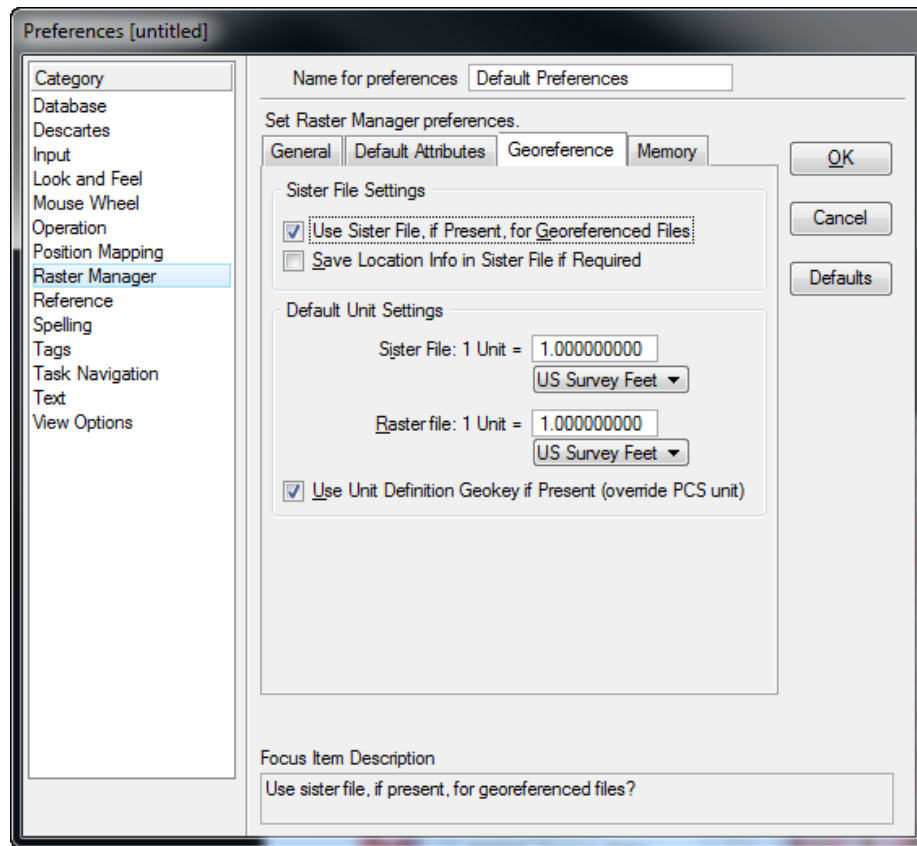


Figure 2-9 MicroStation Preferences Dialog Box

2. On the main MicroStation menu bar select **CTDOT Utilities > Earth Exploration > Geographic Coordinate System Settings**. Change Reproject Elevations to **Yes** on both tabs shown below.

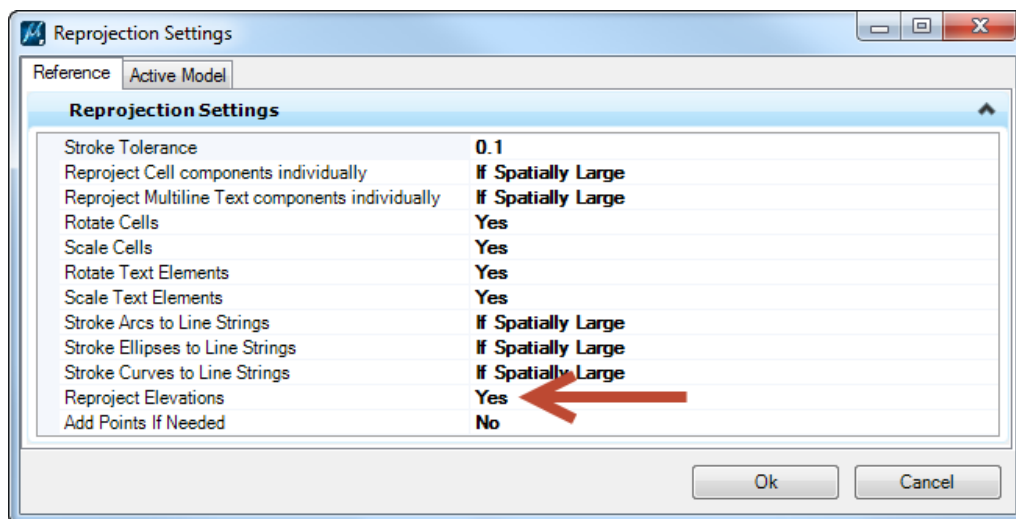


Figure 2-10 MicroStation Geographic Coordinate Reprojection Settings Dialog Box

4. On the MicroStation main menu select **File> Save Settings**.

2.4 Referencing

At this point you may opt to reference in other MicroStation files to define your area of need. Keep in mind this step is not necessarily required because a detailed map of the state of Connecticut will automatically get attached later in this workflow. If you do decide to reference you may encounter one of the scenarios listed below, so it is important to know what types of files you will be attaching. You may need to open each file and make note of the Working Units and Geographic Coordinate System Properties. MicroStation survey ground files created for or at The Connecticut DOT lists the Coordinate System in the title block.

1. Check the working units of each file you will be referenceing. Open each file individually and select **Settings > Design File** and click on **Working Units**.

If the Working Units list US_Survey_Feet proceed to Option 1

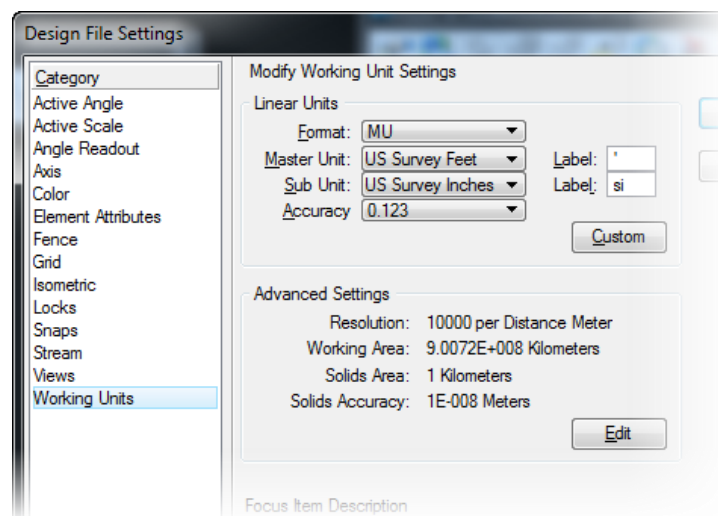


Figure 2-11 MicroStation Standard Unit Design File Setting

If the Working Units list 40_foot_eng, 20_foot_eng, extra... proceed to Option 2

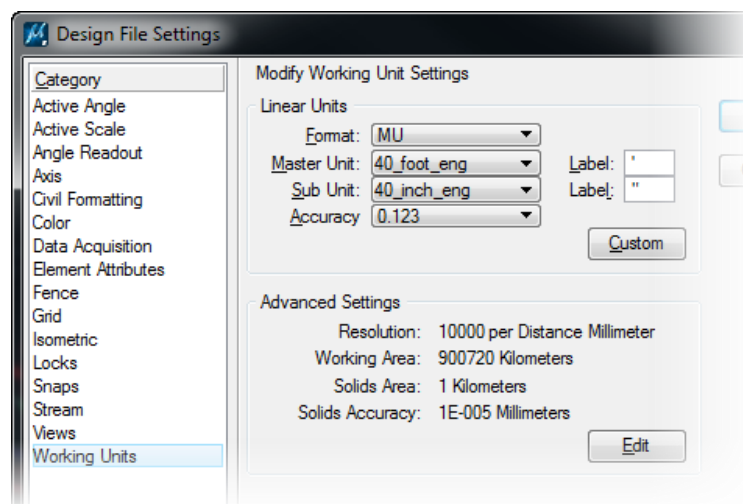


Figure 2-12 MicroStation Custom Unit Design File Setting

Option 1 - Attaching a Standard Unit file

Check if the file has a MicroStation Geographic Coordinate System set. Select **Tools > Geographic > Select Geographic Coordinate System**.

Attaching a file that has a MicroStation NAD 83 Geographic Coordinate System (GCS). This file will reference in the proper location with no adjustment required

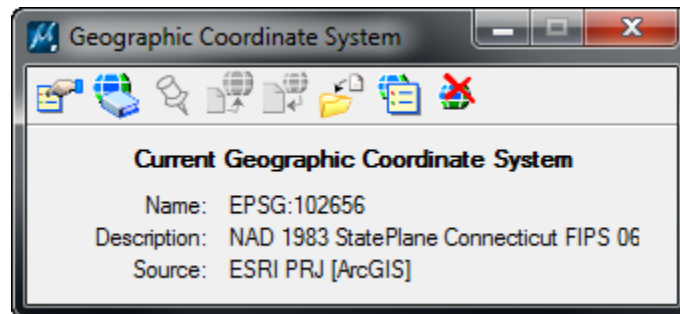


Figure 2-13 Standard Units NAD 83

Attaching a file that has a MicroStation NAD 27 Geographic Coordinate System (GCS). When the Reference Attachment Settings dialog appears select “Geographic – Reprojected” for the Orientation and select the OK button.

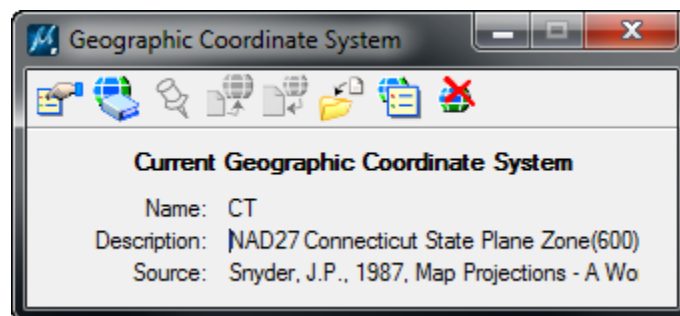


Figure 2-14 Standard Units NAD 27

Option 2 – Attaching a Custom Unit file

Attaching a custom unit based file that uses NAD 83 coordinates and lacks a GCS. When the Reference Attachment Settings dialog appears select “Coincident – World,” then select the OK button. In the References dialog box change the scale to be one to one.

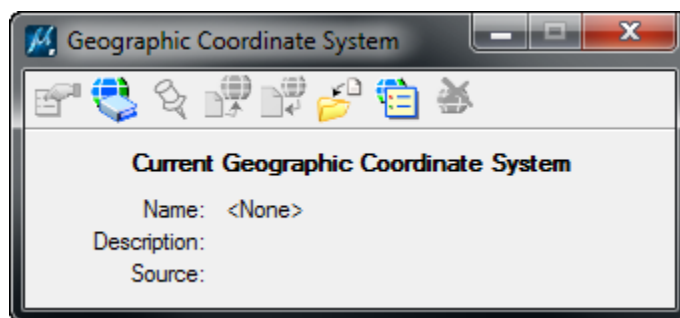


Figure 2-15 Custom Units NAD 83

Attaching a custom unit based file that uses NAD 27 coordinates and lacks a GCS. If you encounter this scenario there are several more steps to follow.

- A. Open the ProjectWise NAD 83 file created in 2.2.1 and temporarily change the Coordinate System to NAD 27
- B. Select **CTDOT Utilities > Earth Exploration > Geographic Coordinate System Library**. Browse to the following folder **Projected (northing, easting...)\North America\United States of America\Connecticut**, select **CT – NAD27 Connecticut State Plane Zone(600), US Foot** and select **OK**.
- C. On the Geographic Coordinate System Changed dialog box select **Reproject the Data to the new Geographic Coordinate System** and select **OK**.
- D. Now go ahead and reference the file in. When the Attachment Settings dialog appears select “Coincident – World,” then select the **OK** button. In the References dialog box change the scale to be one to one.
- E. Use MicroStation tools to place a shape around your area of interest.
- F. Change the Coordinate System back to NAD 83, select **CTDOT Utilities > Earth Exploration > Geographic Coordinate System Library**. Choose **HPGN/HARN Connecticut State Plane Zone** and select **OK**.
- G. On the Geographic Coordinate System Changed dialog box select **Reproject the Data to the new Geographic Coordinate System** and select **OK**.
- H. You will notice that the shape will be reprojected and the reference file will not. This is ok for now just leave the file as is and move on to the next step.

Section 3 The Aerial Tools Application

The Aerial Tools Application specifically programmed for use with CT DOT data. It is used to locate rasters (aerial photos) and Point Clouds (LiDAR data) and extract the needed files into MicroStation.

3.1 Accessing the Aerial Tools Application

To start using the Aerial Tools Application go to the MicroStation Main menu and select **CTDOT Utilities > Earth Exploration > Load Aerial Tools Application**. A help video can be accessed by clicking on **Aerial Tools Help Video** above the load application.

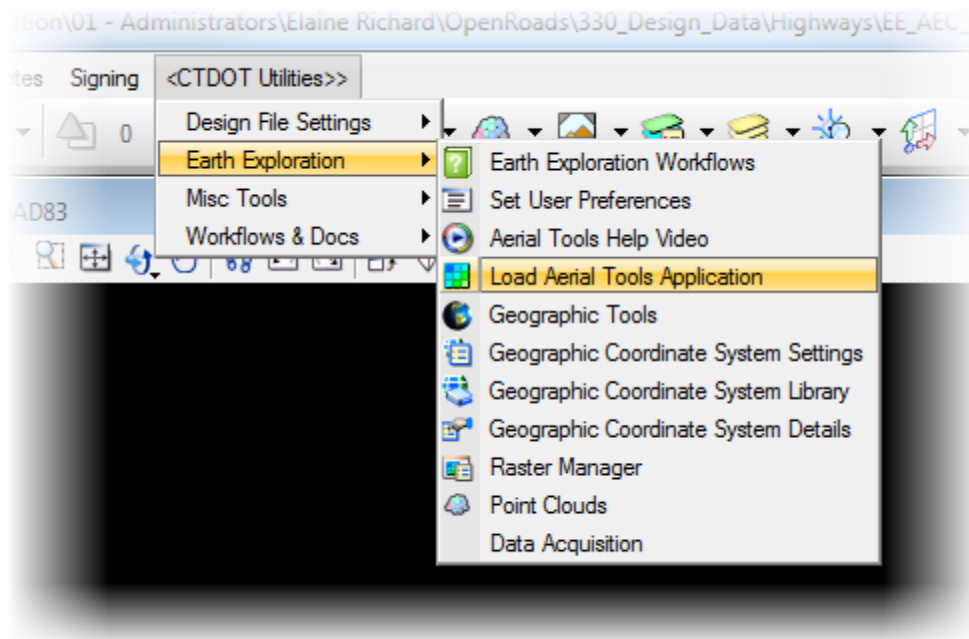


Figure 3-1 MicroStation CTDOT Utilities Menu Drop Down

3.2 Using the Aerial Tools Application

Use the Aerial Tools Application to bring in Aerials Photos and Point Clouds. Here are the basic steps, for detailed instruction watch the help Video mentioned on the previous page.

1. If you don't already have a shape placed for the area of interest click the **Place** button and the MicroStation Place Shape command will load. Place a shape around the area you would like data to appear. Using MicroStation Element Section add the shape to your selection set.
2. Click the **Set** button and yes if it asks you **select last shape placed**.
3. Click the **Refresh** button in Raster and/or Point Clouds area. It may take a few minutes to update if you are loading several files at once.
4. After hitting the **Refresh** button in the Point Clouds section an Attach Point Cloud Reference File Dialog box will appear. Go ahead and click the **Cancel** button for each Point Cloud getting attached, work is being processed behind the scenes so this dialog box is not needed.
5. Click **Done** on the Aerial Tools Dialog Box and the application will close.

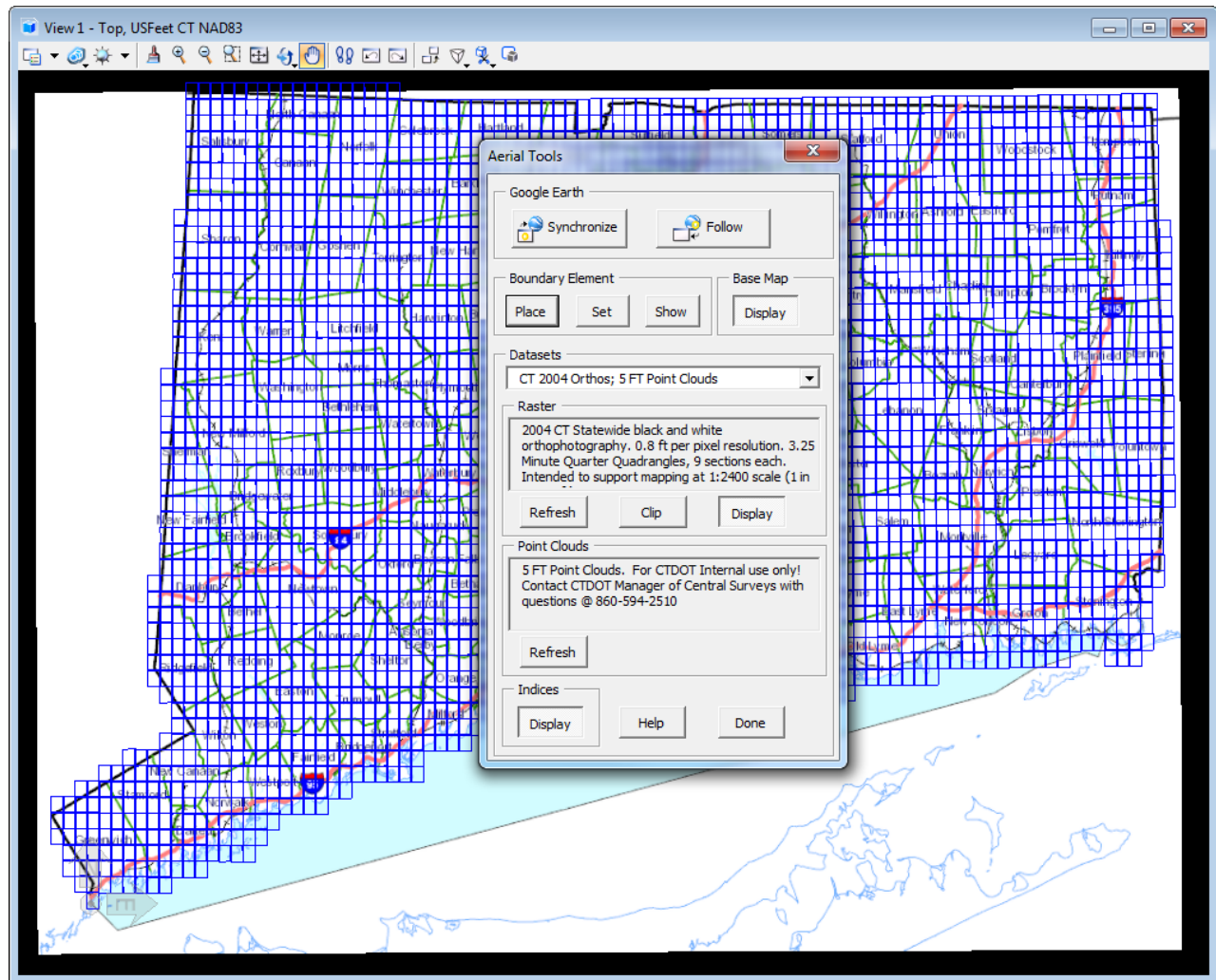


Figure 3-2 MicroStation View with Aerial Tools Dialog Box with Connecticut Background Map

Section 4 Point Clouds

A point cloud is a data file which can include a large number of points on the surface of an object. A point cloud is a set of vertices in a 3D coordinate system and these vertices are defined by X, Y and Z coordinates. Point clouds are usually created by 3D scanners. These devices measure a large number of points on the surface of an object and output a point cloud as a data file. The point cloud represents the visible surface of the object that has been scanned or digitized. Point clouds are used for many purposes, especially to confirm measurements between the DGN model and the real world.

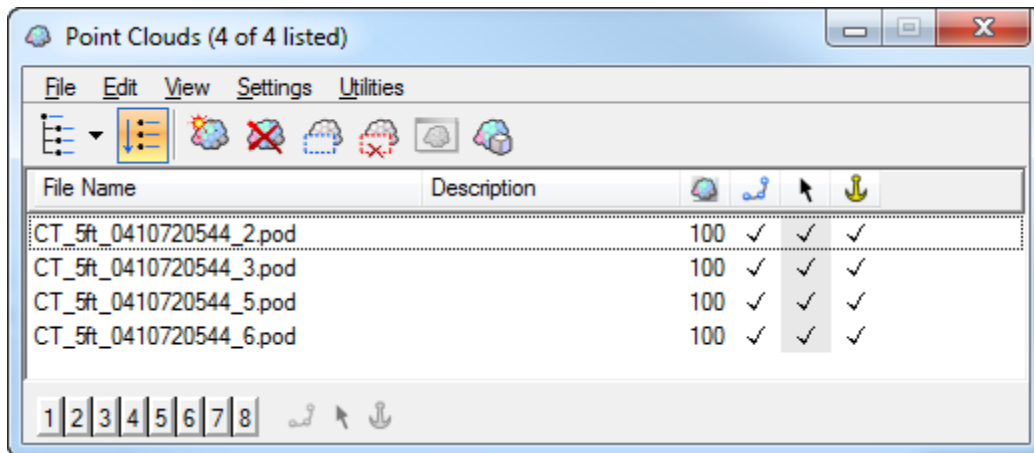


Figure 4-1 MicroStation Point Cloud Dialog Box

4.1 Point Cloud Display

1. Select the **View Attributes** icon on your View window.

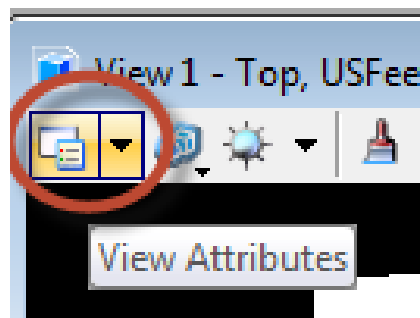


Figure 4-2 MicroStation View Attributes Button

2. For Point Cloud Presentation select **Elevation**.
3. To change the display click on the Magnifying Icon under Point Cloud Presentation. Select the desired look under Depth and Colorization and click Save Settings.

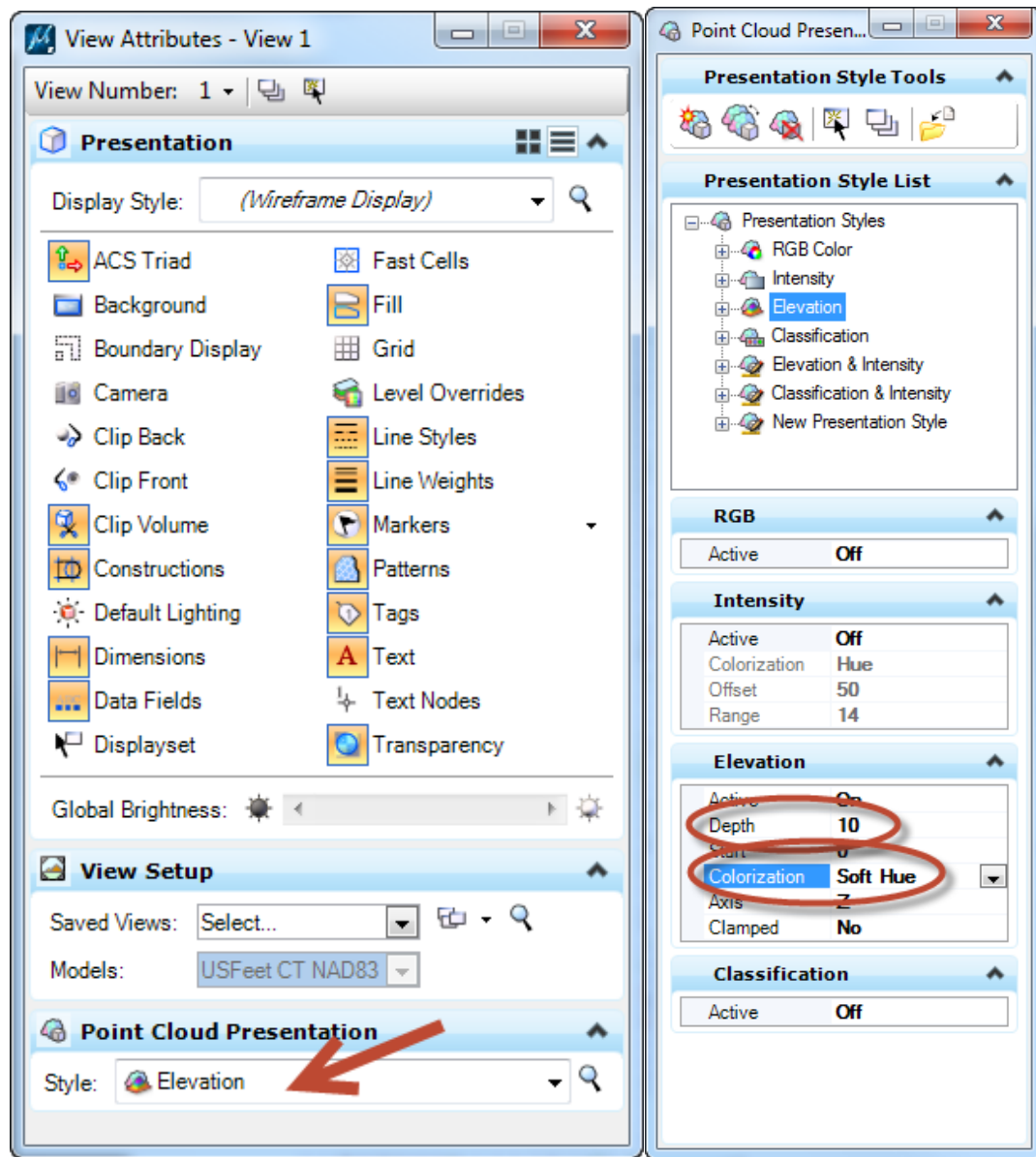








Figure 4-3 MicroStation View Attributes Dialog Box and Point Cloud Presentation Dialog Box

4.2 Using Point Clouds

The Point Clouds tools allow you to import, control, visualize and manipulate point cloud images. You can import a point cloud into a DGN and use it as a visual reference. The Point Cloud dialog (File > Point Clouds), along with the Point Cloud toolbox (Tools > Point Cloud), lets you control all aspects of attaching and manipulating point cloud image files. A point cloud is treated as any standard element and can be part of a model or level. MicroStation Point Clouds are POD files, this format allows you to work with huge point clouds at an great performance.

To	Select in the Point Cloud toolbox
Open the Point Clouds dialog, which is used to control the display of the point clouds.	 <i>Open Point Clouds Dialog</i>
Opens the Open dialog, which allows you to attach a point cloud.	 <i>Attach Point Cloud</i>
Detach a point cloud.	 <i>Detach Point Cloud</i>
Clip a point cloud.	 <i>Clip Point Cloud</i>
Delete a clip from a point cloud.	 <i>Delete Clip from Point Cloud</i>
Open the Point Cloud Presentation dialog.	 <i>Point Cloud Presentation</i>

You can open multiple point cloud files simultaneously. Also, you can batch convert multiple point clouds files either to one POD file, convert the data to AACII format or create a terrain model.

Section 5 Re-Projecting Data

At this point you must have the needed aerial photos and /or point clouds attached. You are currently working in the NAD 83 coordinate system and will follow this workflow if you need to to reproject these files to a different system. Most needed reprojections will be English NAD 83 – NAVD 88 to English NAD 27 to NAVD 29. But in some cases the English NAD 83 – NAVD 29, English NAD 27 – NAVD 88 and metric reprojections may be needed.

5.1 Convert to Metric

If you need to work in metric you will need to change your working units **select Settings > Design File**. Click on **Working Units** and change as shown in the figure below. If you do not need to change units skip to step 2.

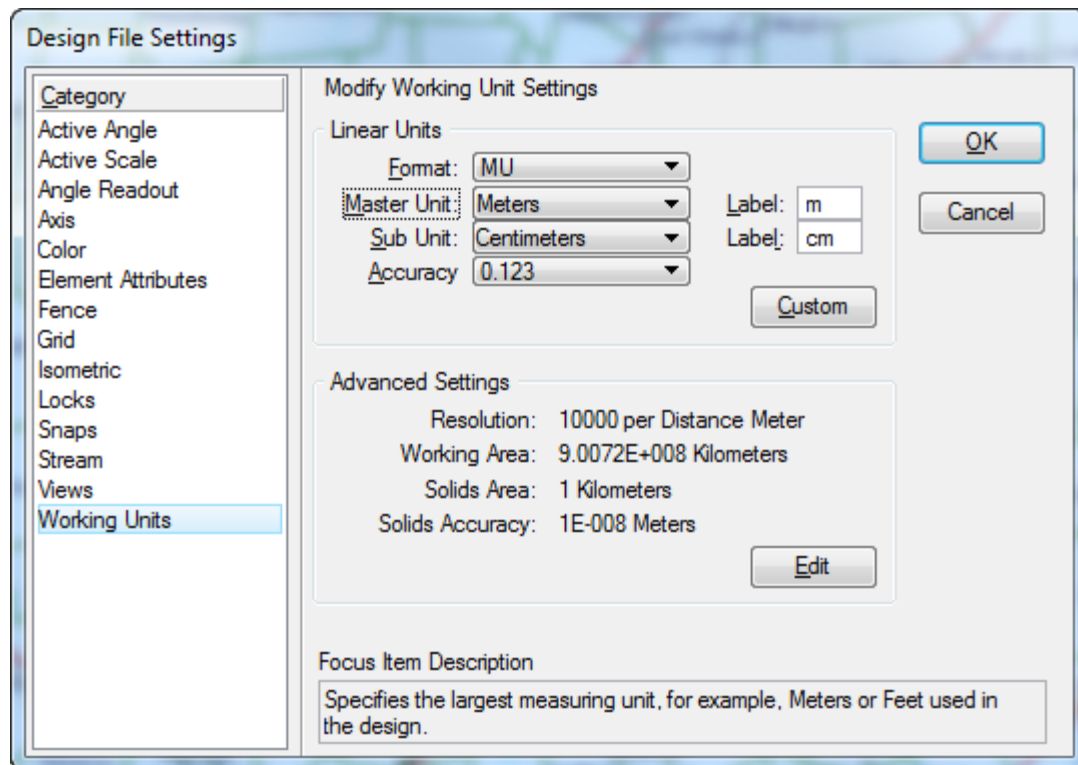


Figure 5-1 MicroStation Design File Settings Dialog Box

5.2 Horizontal Re-projection

1. To change the Coordinate System, select **CTDOT Utilities > Earth Exploration > Geographic Coordinate System Library**. Browse to the needed system and select **OK**.

For NAD 83 English select: **EPSG: 102256- NAD 1983 HARN StatePlane Connecticut FIPS 0600**

For NAD 83 Metric select: **CTHP - HARN (HPGN) Connecticut State Plane Zone, Meter**

For NAD 27 English and Metric select: **CT- NAD27 Connecticut State Plane Zone (600), US Foot**

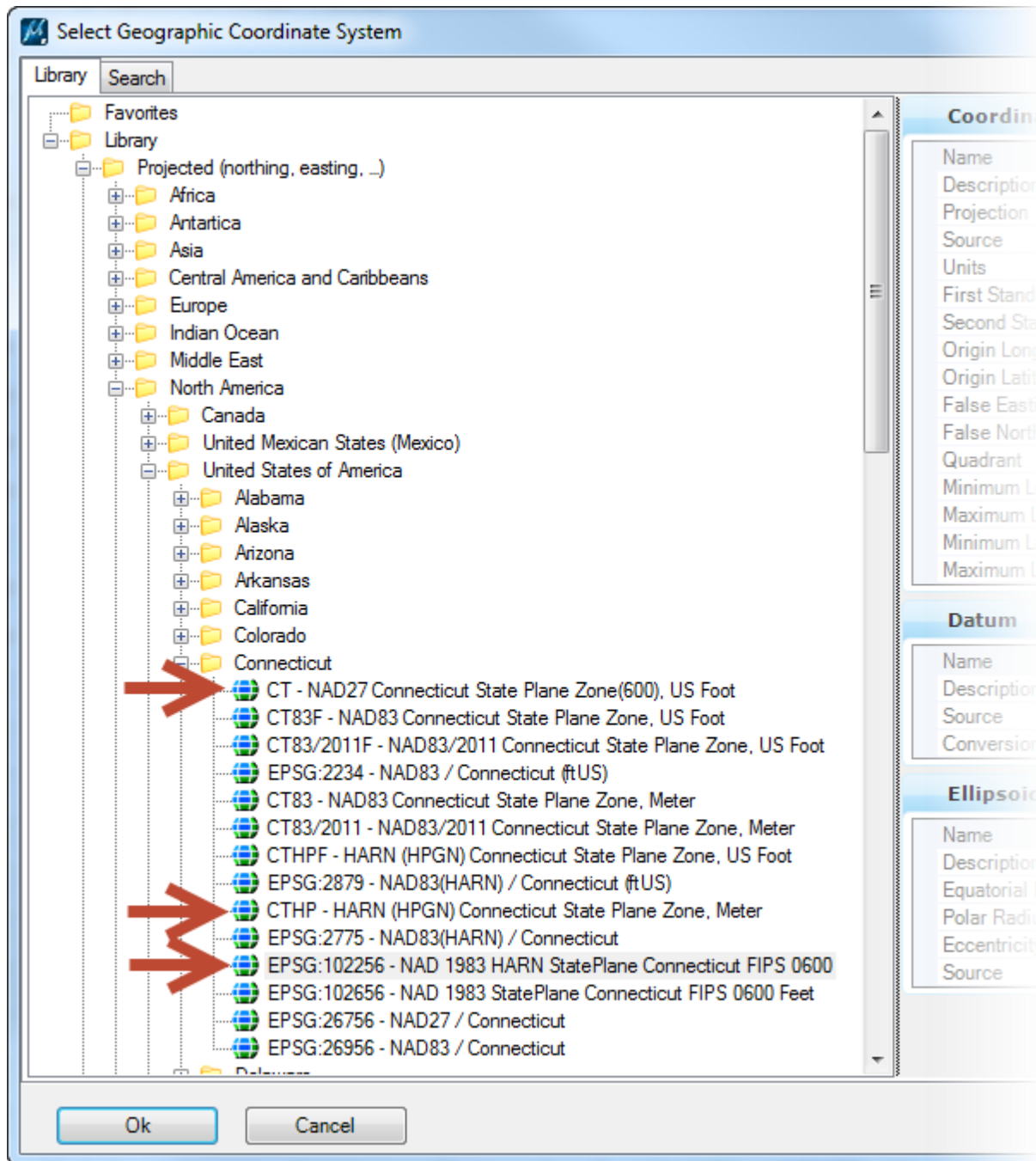


Figure 5-2 Geographic Coordinate System Library

2. On the Geographic Coordinate System Changed dialog box select **Reproject the Data to the new Geographic Coordinate System** and select **OK**.

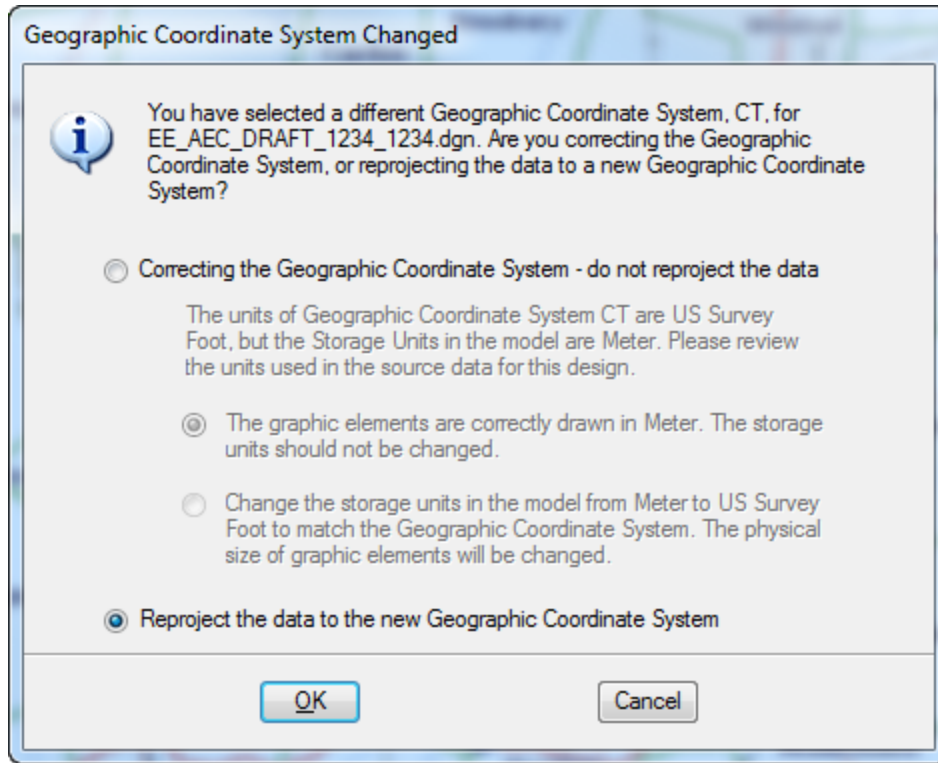


Figure 5-3 MicroStation Geographic Coordinate System Changed Dialog Box

5.3 Vertical Re-projection

Check the correct NAVD is being used. Select **CTDOT Utilities > Earth Exploration > Geographic Coordinate System Details**. Change the Vertical Datum to the required NAVD and select **OK**.

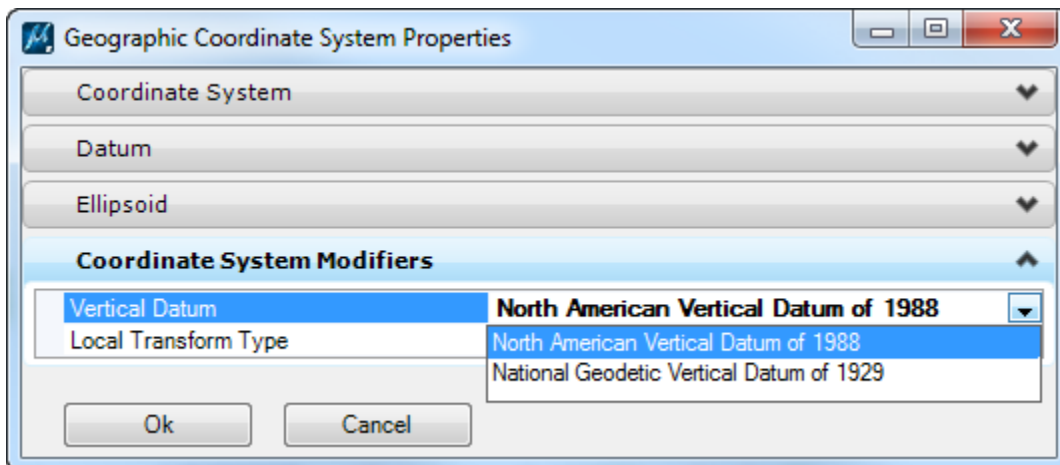


Figure 5-4 MicroStation Geographic Coordinate System Properties

5.4 Renaming Model

1. On the Geographic Coordinate System Changed dialog box select **Reproject the Data to the new Geographic Coordinate System** and select **OK**.
2. Update the name of your model in the Models Dialog box

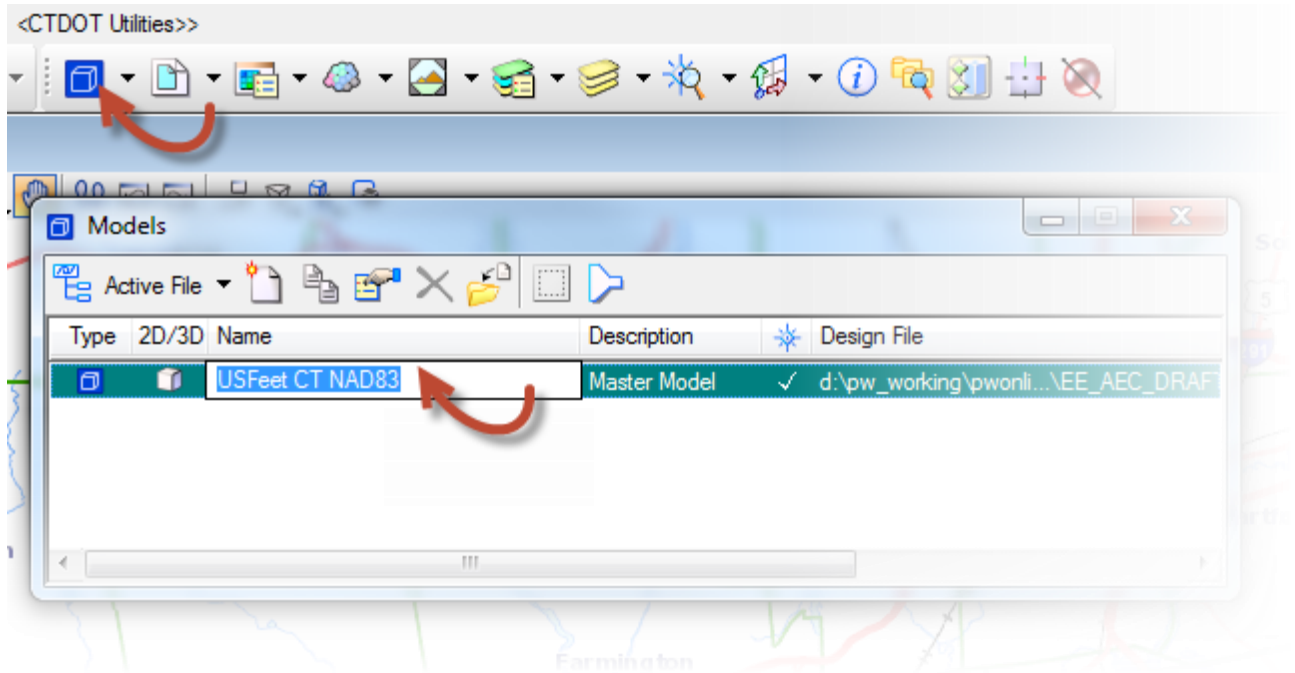


Figure 5-5 Edit Model name – MicroStation Models Dialog Box

3. If you need to use Aerial tools again you will need to set the coordinate system back to NAD 83 by selecting HARN (HPGN) Connecticut State Plane Zone, US Foot.

As stated in the introduction it is imperative that you check and make sure the following minimum software versions are loaded on your machine. The point cloud will not reproject if you have older versions of MicroStation.

Section 6 Using Point Clouds to Create Surface Data

6.1 Export Point Clouds to ASCII

At this point you will need to have the MicroStation file opened that contains the point cloud and datum you would like to work in.

1. Open the Point Clouds Tool Box. Select **CTDOT Utilities > Aerial Tools > Point Cloud Tools**.
2. Verify that all the needed point cloud POD files are turned on and selected.
3. Use the Point Clouds clip command to clip the needed area.

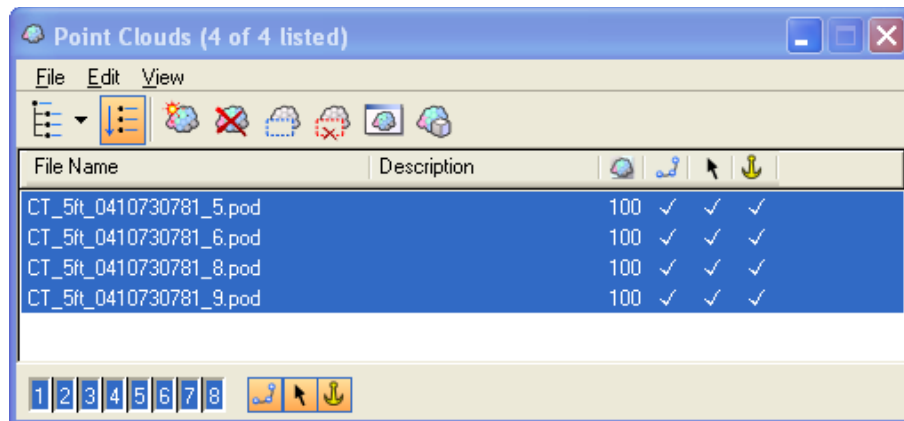


Figure 6-1 MicroStation Point Clouds Dialog Box

4. On the Point Clouds dialog box select **File > Export**. Change the format to ASCII (*.xyz) and Region Filter to Clip and select **OK**.

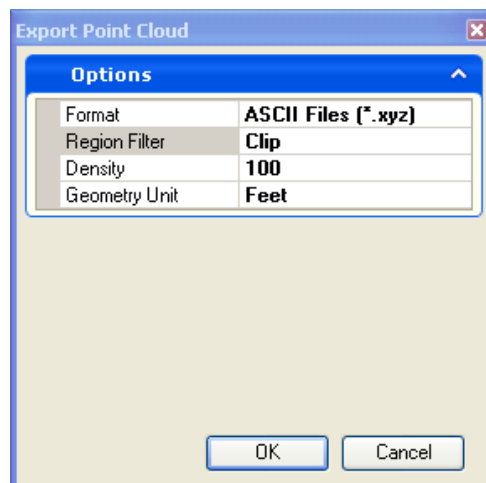


Figure 6-2 MicroStation Export Point Cloud Dialog Box

5. If you want to save the ASCII file in ProjectWise select **No Wizard** and **OK**. Select the correct folder path, edit the Name, Description and File name fields. Click **Save**.

6. If you want to save the file outside of ProjectWise click **Cancel** on the Select a Wizard Dialog box. Browse to the location you would like to store your file. For example, in a project on the X drive. Select the correct folder path and name the file. Click **Save**.

6.2 Import Point Clouds to Data Acquisition

At this point you will need to have the MicroStation file opened that contains the point clouds.

1. Open the Point Clouds Tool Box. Select **CTDOT Utilities > Aerial Tools > Point Cloud Tools**.
2. Verify that all the needed point clouds POD files are turned on and selected.
3. Use the Point Clouds clip command to clip the needed area or place a fence around the desired points.

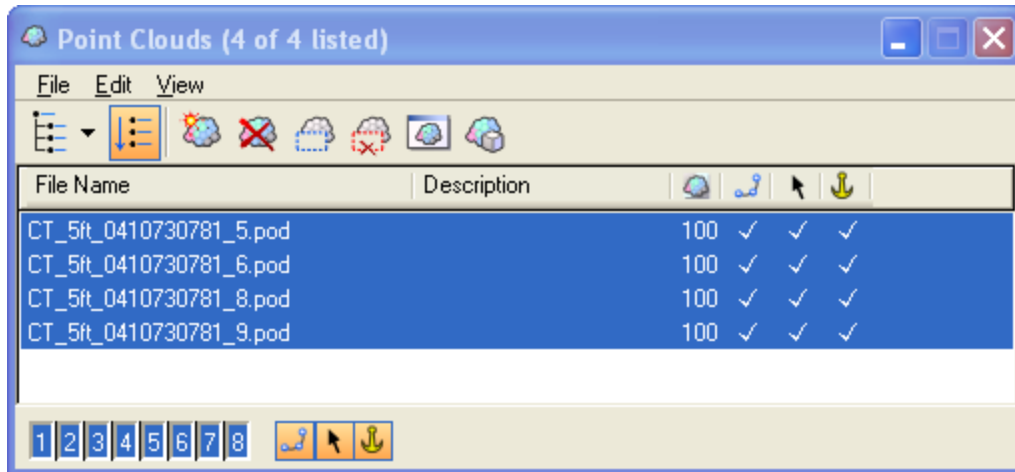


Figure 6-3 MicroStation Point Clouds Dialog Box

4. Select **Data Acquisition Icon** on the Task Bar.
5. In the Data Acquisition Dialog box right click on Surfaces and select **Create Surface... > Import From Point Clouds**.

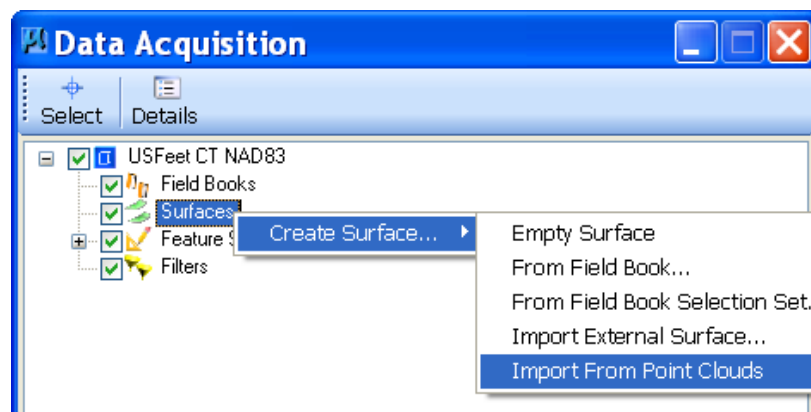


Figure 6-4 MicroStation Data Acquisition

6. Select the Tin filter and in the Z Tolerance field input **.25**, select **Coarse** and **Reinsert Points**. Select the Filter button and notice the size reduction. Click **Accept** on The Point Cloud Surface Dialog box.

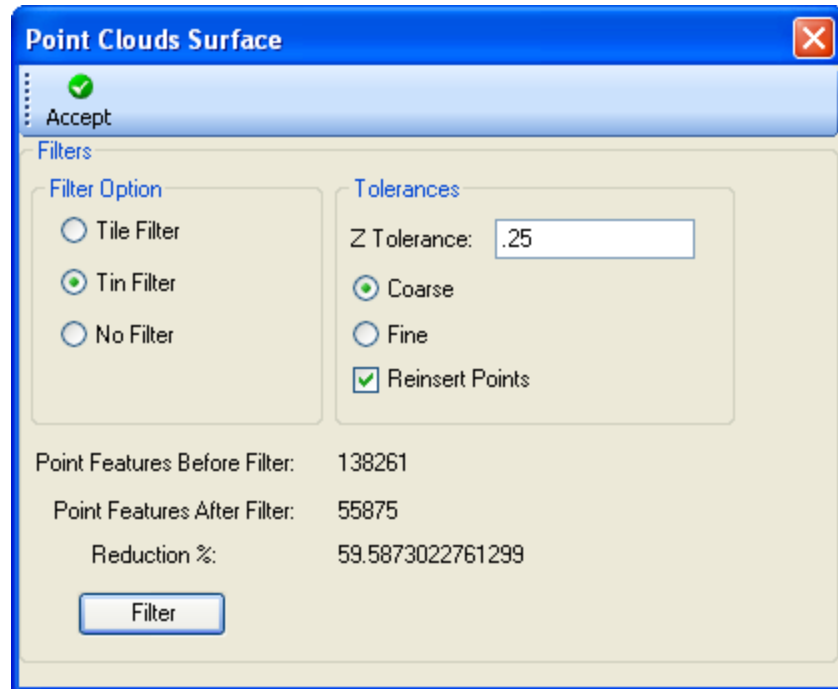


Figure 6-5 MicroStation Data Acquisition Import Point Cloud Surface Dialog Box

7. Turn off all the point clouds in view 1. If you just brought in a large point cloud it is advised that you close MicroStation at this point and check the file back into ProjectWise to clear your computers virtual memory.

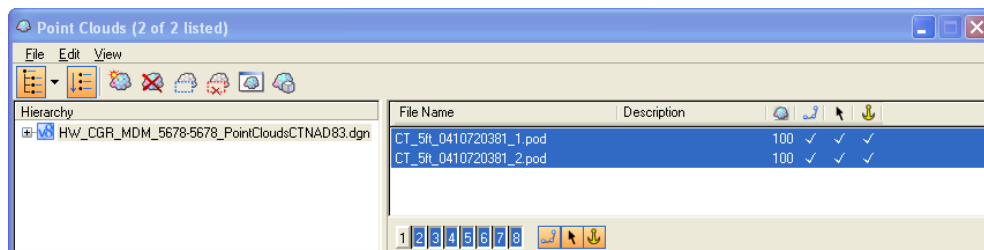


Figure 6-6 MicroStation Point Clouds Dialog Box – Off in View 1

8. In ProjectWise open the MicroStation File again and continue on. In Data Acquisition turn on the contour features for the point clouds surface. Users have the option of turn on and off all the other features listed in the figure below.

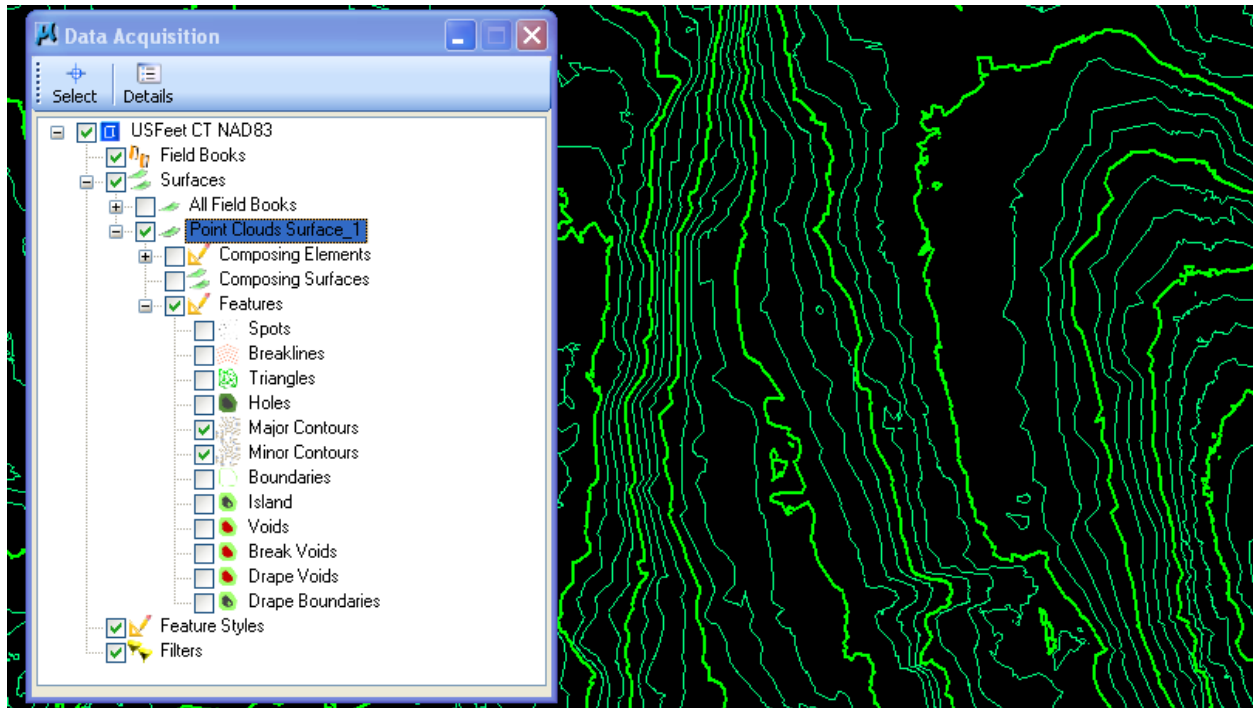


Figure 6-7 MicroStation Data Acquisition View Contours

9. To change the contour interval select Surface in Data Acquisition and in the Details Dialog box adjust as needed.

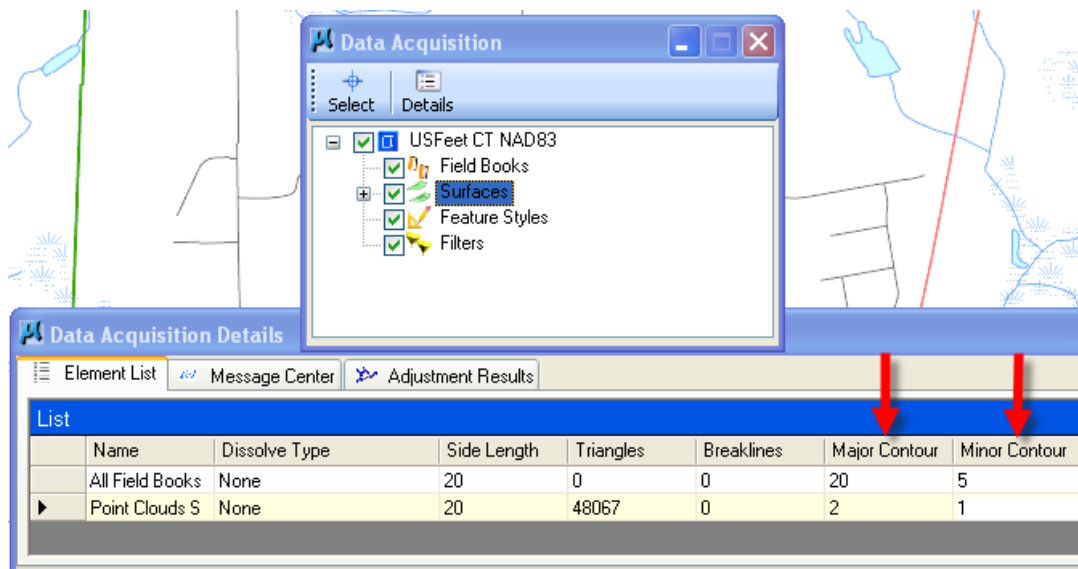


Figure 6-8 Data Acquisition – Edit Contour Interval

10. It is important to note that all of these features are displayed virtually and are not written to the file. If you would like to permanently write the graphics displayed to file. Right click on the new surface and select Create Graphics. This will only write the specific graphics that virtually displayed.

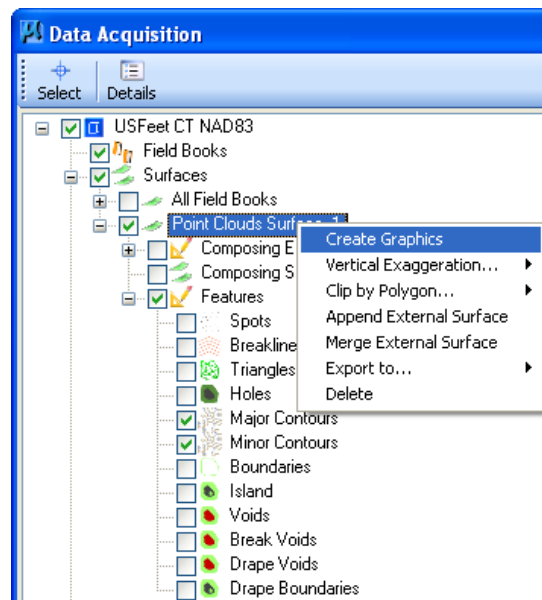


Figure 6-9 Data Acquisition – Create Graphics Command

6.3 Create a DTM from ASCII

1. Open InRoads and make sure the correct XIN is open.
2. Create a new surface
3. Use the Text Import Wizard to Import the ASCII file. Select **File > Text Import Wizard**.
4. The Data Type should be set to Surface. In the File Name field browse to the location of the ASCII file. On the Open dialog box change Application or extension to **All** and click **OK**. Click **OK** on the Text Import Wizard dialog Box.

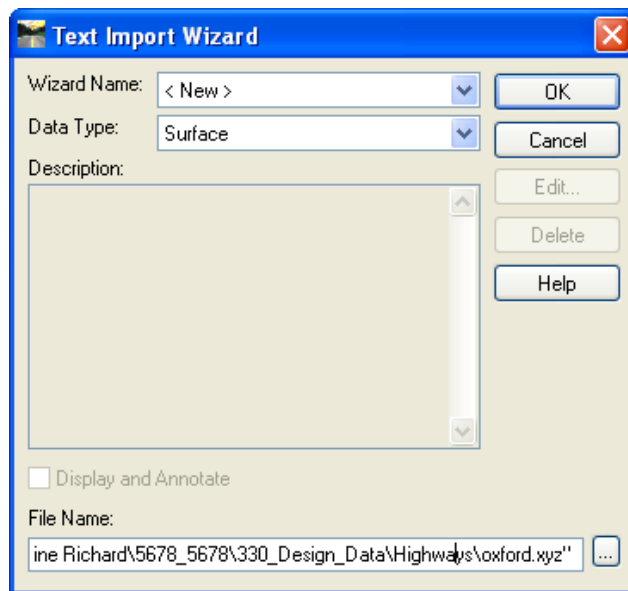


Figure 6-10 InRoads Text Import Wizard Dialog Box

5. Click **Next** through the steps of the Wizard. On Step 4 set up the column definition, **column 1 = Easting, column 2 = Northing, column 3 = Elevation** and select the **Finish Button**.

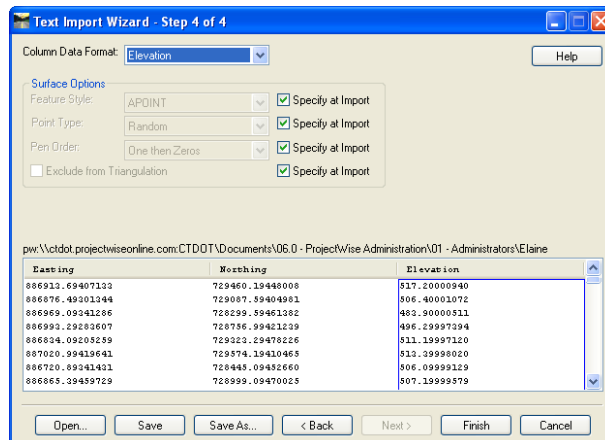


Figure 6-11 InRoads Text Import Wizard Dialog Box

6. In the Surface Options dialog box select a Seed Name and select the needed Feature Style, **LIDAR5** or **LIDAR20**. If these names do not exist select **APOINT**. Select **OK**.

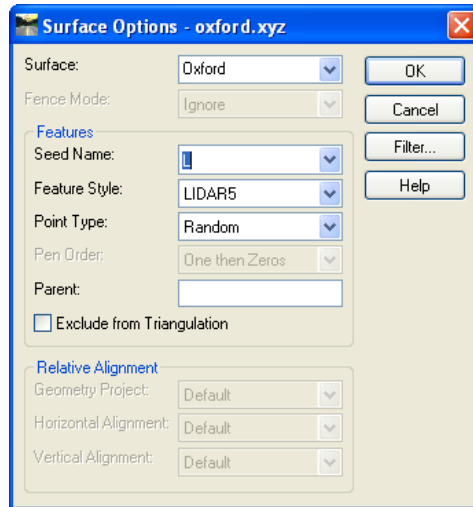


Figure 6-12 InRoads Surface Options

7. Select **Surface > Triangulate Surface**. Select the new surface and **Apply**.
8. To verify the location of the surface select **Surface > View Surface > Perimeter**. Select the new surface and **Apply**.

6.4 Create a DTM from Data Acquisition

1. Right click on the new surface and select **Export to... > InRoads DTM**.

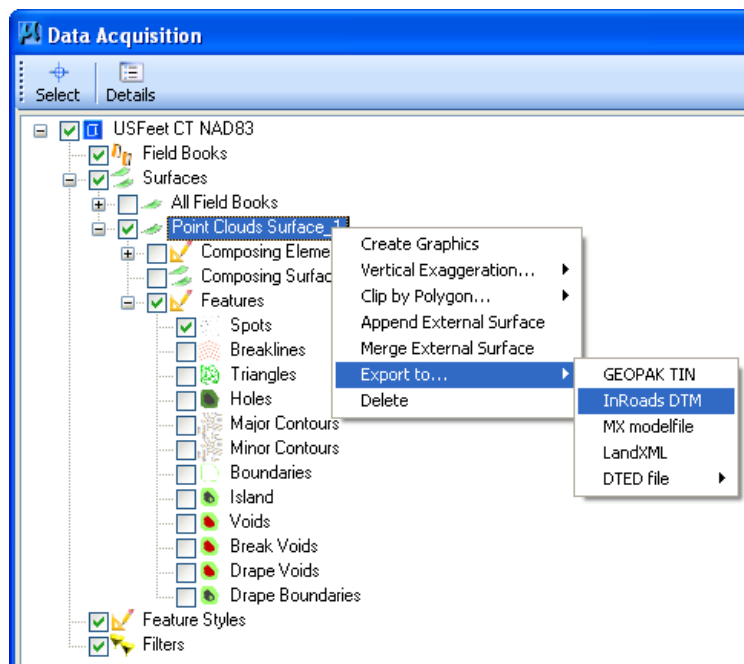


Figure 6-13 Data Acquisition Export to InRoads DTM Command

2. If you would like to save the DTM file in ProjectWise select **Advanced Wizard**. Step through the wizard and attribute as shown below.

3. If you would like to save the DTM to an external location select **Cancel** and browse to the desired location, name the file and click **Save**.

The screenshot shows a software window titled "Advanced Document Creation Wizard" with a close button in the top right corner. Below the title bar is a section titled "Define Document Attributes" with a yellow star icon and the instruction "You should define environment specific document attributes." The main area contains several input fields and dropdown menus. A vertical scrollbar is on the right side of the main area. At the bottom, there are three buttons: "< Back", "Next >", and "Cancel".

Advanced Document Creation Wizard

Define Document Attributes
You should define environment specific document attributes.

Discipline
SV

Main Category
DAT

Main Category Description
Data

Sub Category
HVD

Sub Category Description
High Value Data

Project Number(s)
5678-5678

Label (User Defined)
PointClouds

Description

CT Code (Auto Fill In)
SV_DAT_HVD_5678-5678_PointClouds

CTDOT Asset Tags

Bridges
Signal Intersections

< Back Next > Cancel

Figure 6-14 ProjectWise Advances Document Creation Wizard – Define Document Attributes

6.5 Create a DTM from Graphics

1. In the NAD 83 file write the Data Acquisition Points to the file. Start by turning on the virtual points by selecting **Features > Spots**.
2. Permanently write the spots displayed to file. Right click on the new surface and select **Create Graphics**.
3. Now you should do some data clean up so all you see is the Spots that were just written to graphics. Right click on the new surface in Data Acquisition and click **Delete**.
4. Open the Point Clouds Dialog Box and detach all the Point Clouds.

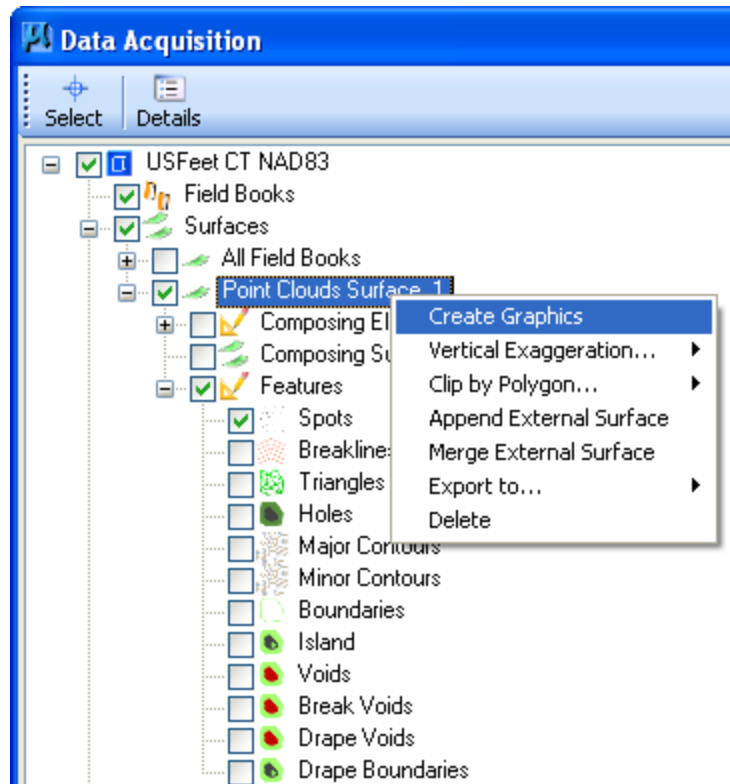


Figure 6-15 Data Acquisition – Create Graphics Command

5. Open InRoads and make sure the correct XIN is open. On the InRoads Main Menu select **File > Import > Surface**.
6. Use the MicroStation tool and place a fence around the Spots.

7. Fill out the dialog box as shown below. On the **From Graphics** tab select **Fence** for Load From. For Feature Style select **LIDAR5** or **LIDAR20**. If these names do not exist select **APOINT**. Select **OK**.
8. Click **Apply** to create the DTM

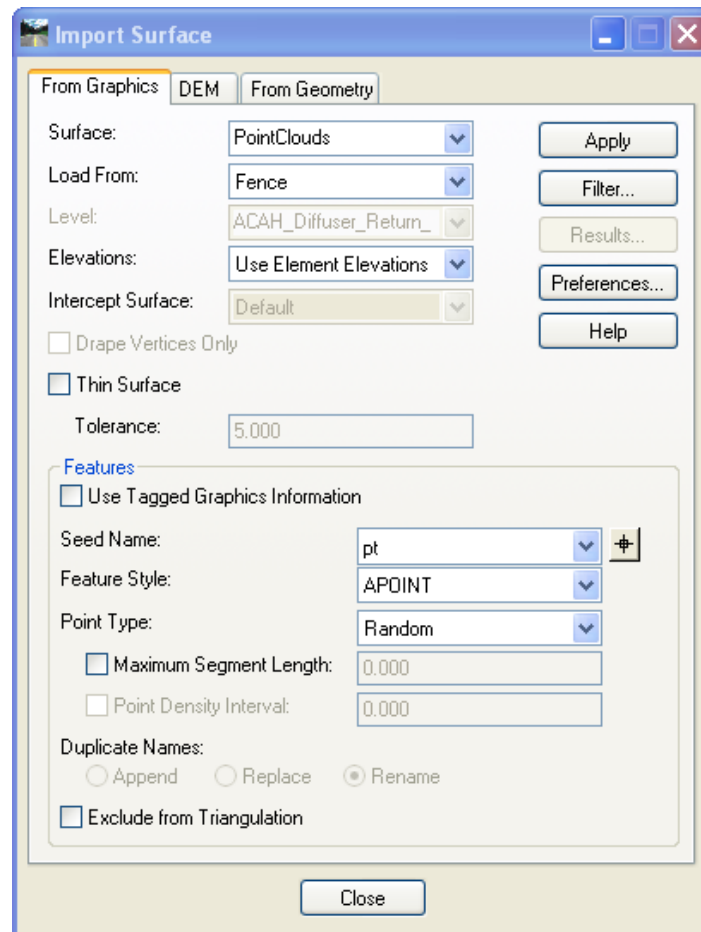


Figure 6-16 InRoads Import Surface Dialog Box

9. Using MicroStation Delete the graphics that were just imported.

10. In InRoads view the triangles, select **Surface > View Surface > Triangles**. Click **Apply**. Select **Yes** to Re-triangulate.

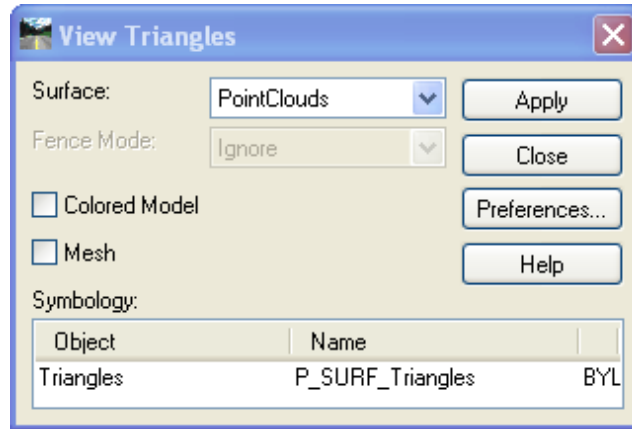


Figure 6-17 InRoads View Triangles Dialog Box

11. Right click on the InRoads Surface and Select **Save As...**

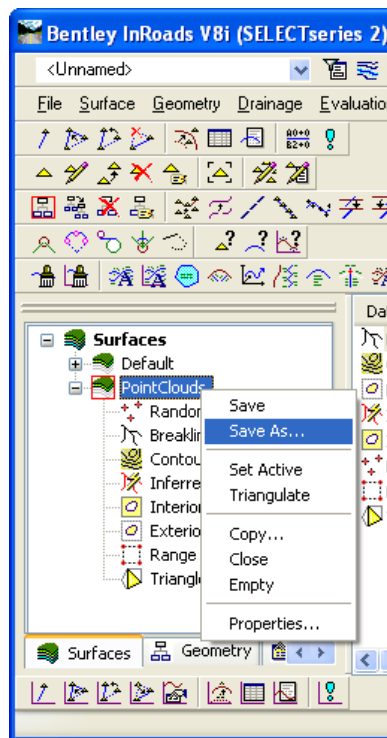


Figure 6-18 InRoads Application Dialog Box

12. If you are saving the surface in InRoads click **Save** on the Save As dialog that appears. Be sure the Document name and File Name are filled in.

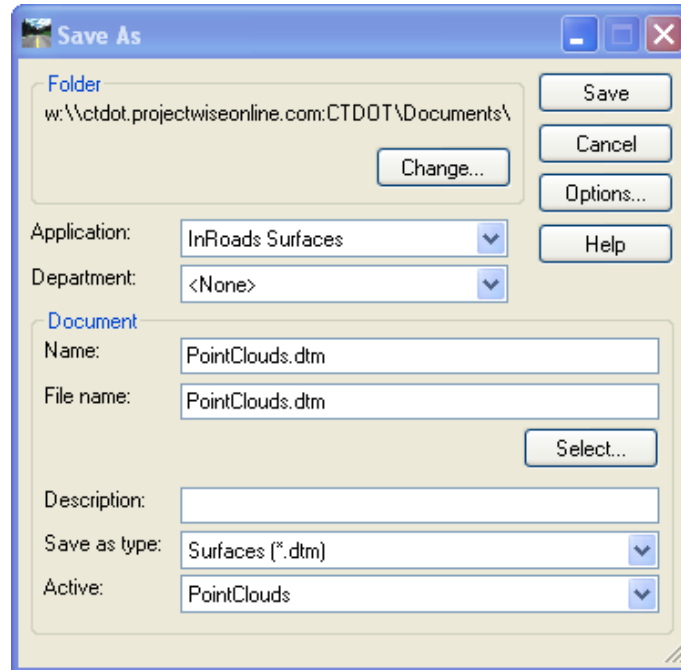


Figure 6-19 InRoads Save As Dialog Box for ProjectWise

13. If you wish to save the DTM externally select **Cancel** and save the files using the next Save As dialog box.

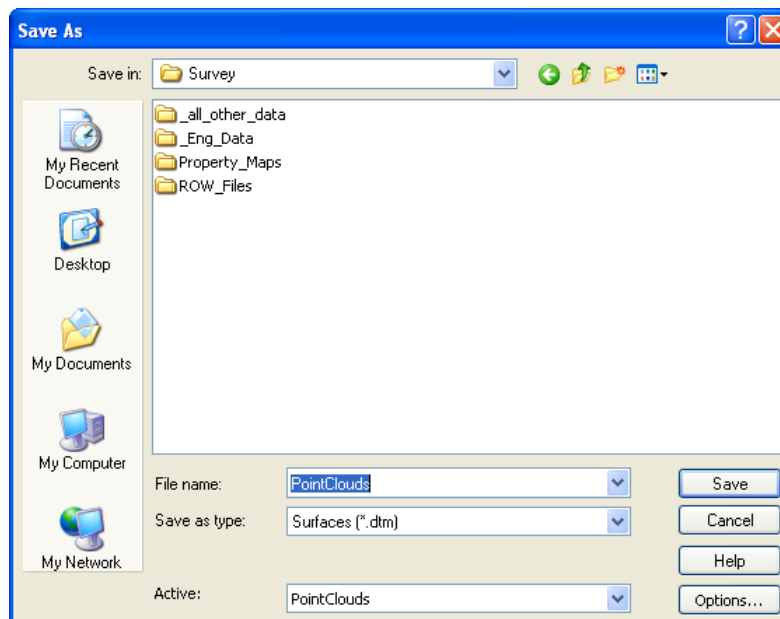


Figure 6-20 InRoads Save As Dialog Box

Section 7 Finishing Up

7.1 Check Files Into ProjectWise

1. If you have InRoads Open close it first. On the InRoads Main Menu select **File > Exit**.
2. In the Check In Dialog Box click on the all files you would like the Check in except for the DGN you are currently in and click the **Check In** button.
3. On the MicroStation Main Menu select **File > Exit**.
4. In the Check In Dialog Box click on the DGN file you are currently in and any other files you would like to check in and click the **Check In** button.
5. In ProjectWise Explorer go back and Attribute any DTM's that were created and placed in ProjectWise. Select the file and click the space bar. This will bring up the Properties Dialog box.
6. Click **Save** and **Close**. On your key board select **F5** to refresh ProjectWise. Your file has just been renamed to match the Attributes.

The screenshot shows the 'PointClouds.dtm [Unsaved default values] *' dialog box. It has a tabbed interface with 'Geospatial', 'LRS Textual', 'Workspace', and 'Components' tabs. The 'LRS Textual' tab is active, showing 'Attributes', 'More Attributes', 'File Properties', and 'Audit Trail' sub-tabs. The 'Attributes' sub-tab is selected, displaying the following fields:

- Discipline: SV (dropdown)
- Main Category: DAT (dropdown), Main Category Description: Data (text box)
- Sub Category: HVD (dropdown), Sub Category Description: High Value Data (text box)
- Project Number(s): 5678-5678 (text box)
- Label (User Defined): PointClouds (dropdown)
- Description: (empty text box)
- CT Code (Auto Fill In): \$V_DAT_HVD_5678-5678_PointClouds (text box)
- CTDOT Asset Tags section with:
 - Bridges: (empty text box)
 - Signal Intersections: (empty text box)

At the bottom are buttons for 'Save', 'Undo', 'Close', and navigation keys (K, <, 27/40, >, >|).

Figure 7-1 ProjectWise Properties Dialog Box

7.2 Export Files to Network

1. In ProjectWise Explorer right click on the files that you would like to export and select **Export**.
2. Click the **Next** button.
3. On the Define export settings dialog box click **Browse** and select the needed external location. Select **OK** on the Browse to Folder dialog box. Make sure **Send to Folder** is selected and click **Next**. Click the **Finish** button. This will export the MicroStation file along with all the POD (point clouds) files, rasters and reference files that are attached. Repeat for any other files such as any DTM you would like exported.

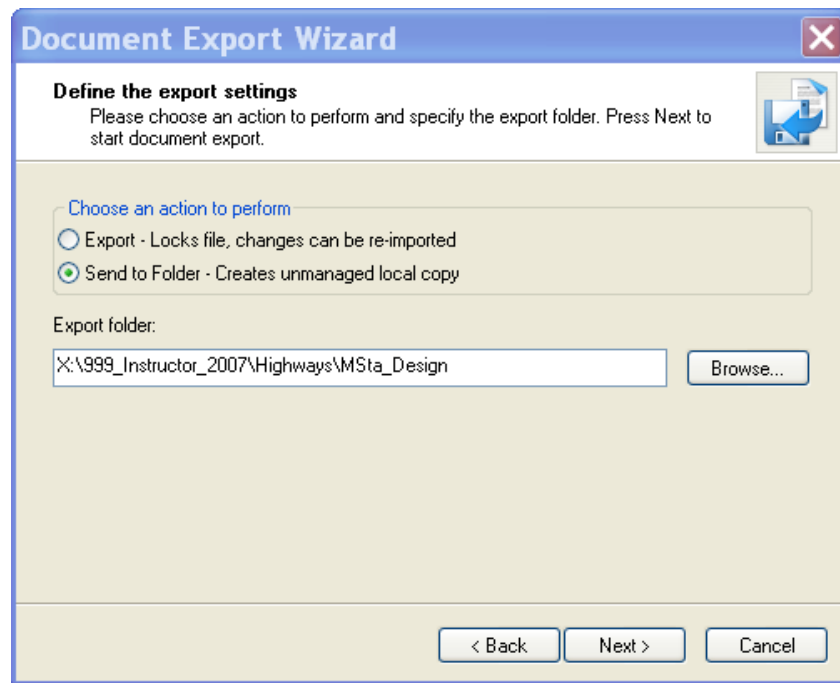


Figure 7-2 ProjectWise Document Export Wizard

4. **DO NOT ATTEMPT TO OPEN THE EXPORTED PROJECTWISE DGN FILE THROUGH ACCOUNTING.** Access MicroStation through Accounting and open an existing native network DGN file or create a file from the W drive seed file **W:\Workspace\Standards\seed\CT_Design_3D_V8i.dgn**. Using nested attachments reference in the exported ProjectWise DGN file and set the scale 1 to 1.

Section 8 Glossary

Geographically Re-projected

Survey is usually delivered in the Connecticut State Plane coordinate system NAD83 horizontal datum but in some instances it may be in NAD27. MicroStation now delivers tools that will make it possible to accurately project data in NAD83 line up will data from NAD27 and vice versa.

LiDAR

LiDAR means Light Detection And Ranging, it acquires data for thousands of points over the Earth's surface within a fraction of a second. LiDAR is the Remote Sensing technology that can find the range and other information about a particular distant object by the means of measuring the properties of scattered lights. The LiDAR sensors emit laser pulses in a scanning array, the information about the objects are determined from the time interval of these LiDAR (Light Detection And Ranging) pulses. The time delay of these transmitted pulses and detected reflected signals are taken as a distance of an object or surface.

MicroStation Point Cloud

A point cloud is a data file which can include a large number of points on the surface of an object. A point cloud is a set of vertices in a 3D coordinate system and these vertices are defined the by X, Y and Z coordinates. All of our LiDAR data has been converted to POD (Points Database) the point cloud file format used by MicroStation. The POD files use a point cloud engine which allows you to work with huge point clouds with quick speed and great performance compared to importing separate points into MicroStation.